FIRE PROTECTION CRITERIA

Fire protection designs will conform to the requirements of applicable standards contained in the current editions of the National Fire Codes (published by the National Fire Protection Association [NFPA]), MIL-HDBK 1008, and the Uniform Building Code.

Fire protection requirements:

- These facilities are classified by NFPA-101 as "New Hotel and Dormitories".
- Automatic sprinkler systems will be installed in facilities where required by the installation, using service or con-struction conditions. System design will conform to NFPA 13. Automatic sprinkler systems will be installed in all areas required by the National Fire Codes, and in areas or facilities where cost-effective or appropriate based on the above.
- Heat or smoke detection systems, or both, are required in VOQ facilities. Smoke detectors will be provided in all living units whether or not an automatic sprinkler system is provided. Installation of the systems will conform to the requirements of NFPA 72E, NFPA 101, and MIL-HDBK 1008.
- Manual evacuation and fire alarm systems will be installed in all VOQ's. These should be located in the lobby and corridors. A fire alarm audible and visual device is also required in each living unit.
- Fire alarm systems should be zoned by wing and floor.
- Automatic sprinkler systems, automatic detection systems, and manual fire alarm systems will be equipped to transmit alarms to the fire station or to a suitable location where responsible personnel are continuously on duty, or both. Automatic fire alarm systems will include means for manual operation.
- Emergency lights shall be provided in the lobby, mechanical room, laundry, stairs, and corridors.
- Storage areas adjacent to exitways must be enclosed by at least 1-hour rated construction.
- Corridors must be 1-hour rated construction.
- Residential wings must be separated from support areas by at least 1-hour rated construction. If horizontal exits are used, 2-hour rated construction must be used.
- Standpipes with 2-1/2 inch hose outlets will be provided in stair towers of buildings exceeding three stories. Provide fire department connections.
- The use of an unprotected opening over the lobby requires that the design meet the requirements of NFPA 101, MIL.-HDBK. 1008, and UBC.
- Living units should be provided with a floor plan of the building that show the exit locations and give fire safety instructions. This information should be attached conspicuously to the back of the entry door.
- Exterior fire protection requirements will be in accordance with MIL.-HDBK 1008 and other applicable criteria. Fire hydrants must be located during final design, and shall comply with TM 5-813-5, and 6.
- Mechanical equipment rooms will have a minimum of one-hour rating (walls and ceilings) for all types of construction, and have only an outside entrance. Boiler rooms, and mechanical rooms with open-flame equipment, may require a 2-hour separation.
- Shafts (elevators and stairs) will have a two-hour rating or an one-hour rating in accordance with NFPA 101.

Types of construction:

- VOQ facilities exceeding three stories in height will be Fire-Resistive Construction (Type I and II F.R.). Fire areas per floor in this type of construction are not limited.
- VOQ facilities three stories or less may be of Noncombustible Construction (Type II-N). Basic fire areas in this type of construction are limited to 20,000 square feet of gross area per floor, but may be increased under the provisions set forth in the UBC.

Interior finishes:

- Interior finishes will conform to the requirements of NFPA 101, except as follows:
  - Interior finish materials for "Exits" will be Class A only.
  - Interior finish materials for other than "Exits" will be Class A or Class B only.
  - "Smoke Developed" Classification by ASTM E 84 Test will not be higher than 50 for Class A interior finish materials, or 100 for Class B interior finish materials.
- Cellular plastics will not be used as an interior finish. Any cellular plastic material used in construction must conform to the requirements of Chapter 17, UBC.
- Trim and incidental finishes not exceeding 10 percent of the aggregate wall and ceiling areas of any room or space, and when the facility is completely sprinklered, may be Class C material in areas other than exits.
- Minimum average critical radiant flux of 0.50 watts per square centimeter will be required for corridor carpet in VOQ's.

HANDICAPPED ACCESSIBILITY

- Handicapped accessibility must conform to the Uniform Federal Accessibility Standards, where applicable unless altered by the requirements below.
- All sidewalks must meet handicapped accessibility standards.
- Parking for handicapped visitors should be at least 4% of the total number of parking spaces, or at least one, whichever is greater.
- Building entrances, lobby, multi-purpose activity room module, restrooms, circulation between these functions, and at least one drinking fountain and one public telephone must be accessible.
- Approximately five percent of the VOQ living units should be handicapped accessible as shown on sheet V-4. It is preferable to designate a complete four unit module as handicapped. If this is not feasible, then the four unit module may be altered so that two units back-to-back are handicapped, while the two across the corridor are the standard design shown on sheet V-3.

SIGNAGE

- Each building in a project will be identified by signage for the convenience of new occupants, visitors, and emergency and service personnel.
- The signage system will include the provision for building identification as assigned by the installation facilities engineer.
- All aspects of the signage system will be coordinated with the installation facilities engineer.
- Exterior signage and building identification will compliment the systems already in use on the installation.
- Signage will be simple in design, pleasing in appearance, and functional.
- Each private living suite door or entry recess will be provided with an identification number.
- Each door or recess may also be provided with an insert frame for displaying identification cards of the occupants, if requested by the installation.
- Signage criteria are stated in detail in TM 5-807-10, Signage.

STRUCTURAL SYSTEMS

- Select the structural system that is appropriate to the exterior material choice and is the most economical, considering local construction practices. Comparative cost studies shall be made between the most apparent competitive systems, and will take into account architectural, mechanical, electrical, and other features where they vary between systems under study.
- Structural design to meet requirements of the latest version of the AEI and TM 5-809-1 through 6, TM 5-809-8 through 11, and TM 5-818-1 or their replacements.
- Structural design requirements for masonry construction are stated in detail in TM 5-809-3, Masonry Structural Design for Buildings.

ELECTRICAL

All criteria given below are subject to revisions, updates, or replacement. It is therefore the responsibility of the final designer to be aware of these changes, and design according to the latest edition or replacement of these criteria.

- Illumination levels are given in the IES Lighting Handbook, and the AEI.
- Maintained illumination levels in the support areas of the VOQ facility are given below:
  - Lounge - 15 fc. This may be increased to a maximum of 30 fc. in areas that will be used for reading, conferences, or other activities.
  - Lobby - 15 fc.
  - Vending/phones - 25 fc.
  - Laundries - 30 fc.
  - Bulk Storage - 5 fc.
  - Corridors - 10 fc.
  - Maid's rooms - 15 fc.
  - Janitor closets, linen closets, etc. - 5 fc.
  - Electrical and communications rooms - 15 fc.
  - Mechanical room - 15 fc.
  - Stairs - 20 fc.
  - Restrooms - 20 fc.
  - Offices and Desk - 50 fc.
  - Mail - 25 fc.
- Recessed lighting fixtures should be used in all habitable spaces where possible.
- Incandescent or decorative fluorescent fixtures are recommended in the lobby, lounge, and desk area.
- Standard recessed fluorescent fixtures may be used in the office, laundry, restrooms, and other spaces.
- Decorative wall mounted fixtures may also be used in the lobby, lounge, corridors, and other areas for "accenting".
- Task lighting should be provided in the lounge. This will vary depending on furniture arrangement.
- Illumination levels in the living units are given below:
  - Living room - 50 fc.
  - Bed room - 20 fc.
  - Bath - 30 fc.
  - Kitchen - 70 fc.
  - Entry and circulation - 10 fc.
  - Closets - 5 fc.
- In the bath, living, and sleeping rooms, task lighting shall be provided to the illumination level shown above. Overall room illumination shall not be less than 30% of the value shown. Recessed can lights, track lighting systems, and wall mounted fixtures are some appropriate methods for achieving overall lighting needs.
  - Task lighting shall be provided over the lavatory in the bath room.
  - Task lighting shall be provided over the sink in the kitchen.
- Fluorescent fixtures may be used in the bathroom and kitchen. Incandescent fixtures should be used elsewhere.
- At least one wall-switch controlled lighting outlet shall be installed in every habitable room.
- Light fixtures will be provided in walk-in closets.
- Receptacles will be required in all areas. These will be located by the designer based on project requirements in accordance with NFPA 70 (National Electrical Code), article 210-60.
- Receptacles must be located in the corridors for housekeeping equipment. These should be located every 80 feet.
- Receptacles with ground fault protection for personnel must be used in bathrooms and kitchens when required by NFPA 70.
- Receptacles on opposite sides of common walls between living units shall be separated by at least one wall stud bay.
- Minimum numbers of electrical duplex receptacles required in each room of the living unit are given below:
  - Living room - 4.
  - Bed room - 4.
  - Kitchen - 2.
  - Bath - 1.
- Power requirements for mechanical equipment must be determined for each project.
- Due to the preponderance of 120 VAC loads in this facility, 208Y/120VAC will be the most likely service voltage.

This design assumes that interior partitions are gyp. bd. on metal studs, and that the electrical conduit is run through the walls. If CMU or another type of partition is used that does not allow for the conduit, a suspended ceiling system must be used.

If a suspended ceiling system is not used, overall lighting fixtures, fire alarms, smoke detectors, etc. must be mounted to the wall. No exposed conduit will be allowed either on walls or on the ceiling.

MECHANICAL

The A/E shall review various heating, ventilating, air conditioning and refrigeration systems for appropriate application in the geographical area in which the project occurs. Eligibility for air conditioning shall be based on criteria found in Architectural and Engineering Instructions (AEI)-Design Criteria, dated March 13, 1987. The HVAC and refrigeration systems shall take into account available sources of energy (such as existing central refrigeration and heating plants), life cycle cost analysis of the proposed systems, energy conservation measures including the utilization of heat rejected from the refrigeration equipment, and local conditions. Ease of maintenance must be an important consideration in the system selection process.

All criteria listed in the following notes are subject to revisions, updates, or replacement. It is therefore the responsibility of the final designer to be aware of these changes, and design according to the latest edition or replacement of these criteria.

- Heating, mechanical ventilation, and air conditioning will be in accordance with the AEI, TM 5-810-1 and TM 5-810-2.
- Plumbing will be in accordance with the AEI, TM 5-810-5, and the National Standard Plumbing Code.
- A renewable energy evaluation will be performed in accordance with the AEI, TM 5-802-1, and the latest edition of ETL's entitled "Evaluation of Solar Energy". This solar evaluation is required by law and cannot be waived.
- Active solar energy systems will be in accordance with TM 5-804-2, and ASHRAE Handbook of Experiences in the Design and Installation of Solar Heating and Cooling Systems, SPSP 18.
- Passive solar energy systems will be in accordance with the current edition of the "Passive Solar Design Handbook"; Vols 1, 2, & 3, DoE/CS 0127-1, 2, 3.
- An energy analysis will be performed to determine project compliance with the energy budget requirements set forth in the latest edition of the AEI.
- Energy conservation and life cycle cost criteria as set forth in TM 5-802-1 and the AEI will supplement the basic criteria here.
- Weather data will be in accordance with TM 5-785.
- Noise control in mechanical equipment rooms and heating plants will conform to the requirements of TB MED 501. TM 5-805-4 will be used for guidance.

COMMUNICATIONS

- Antenna needs for television and user-supplied radio systems will be determined with the using service during the design process and planned so that the installation of the equipment will not be an intrusion on the aesthetic concept of the project.
- One entertainment television outlet will be provided in each private living suite and, where appropriate, in lounges.
- A power receptacle will be located adjacent to each television outlet.
- Telephone outlets and raceway systems will be provided in coordination with the local Director of Information Management.
- Telephone outlets will be provided in private living suites, offices, and areas provided for public phones.
- The main telephone terminal cabinets will be located in the communications closets.
- The building telephone service raceway will be underground.

INFORMATION MANAGEMENT SYSTEMS

Information management systems provisions will consist of terminal/concentrator cabinets, raceways, outlet boxes, device plates, and underground access to the installation's information management system. Outlets will be provided for administrative work stations and other locations specified by the using activity. Cabinet and outlet locations will be coordinated with the local director of information management.

SECURITY

When adapting this definitive design to a specific location, it is required that the process outlined in Security Engineering Manual of the Omaha District Protective Design Mandatory Center of Expertise (PDMCX) be used to determine all protective measures required to defeat a terrorist threat. The Security Engineering Manual may be obtained from the Omaha District Corps of Engineers, ATTN: CEMRO-ED-ST.

Symbol	Description	Date	Approved

* THINK VALUE ENGINEERING - IT SAVES MONEY *

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
TULSA, OKLAHOMA

Designed by: Jay Clark	FACILITIES STANDARDIZATION PROGRAM
Drawn by: Jay Clark	VISITING OFFICER QUARTERS
Checked by: T. H. Verdel	TECHNICAL INFORMATION
Submitted by: T. H. Verdel	Scale: NONE; Sheet reference number: V-20; JOB # 88
Chief, Arch. Sec.	Date: NOVEMBER, 1988; Dwg. code: DEF 724-15-01; Sheet 20 of 20